

# **PROFILE SHEET** **Physical Science**

**Publisher: Glencoe/McGraw-Hill**

**Text/Instructional Material: Physical Science, Online Edition, 2002**

Science Standard	Rating		
	Adequate	Limited	No Evidence
PS.1	✓		
PS.2	✓		
PS.3	✓		
PS.4	✓		
PS.5	✓		
PS.6	✓		
PS.7	✓		
PS.8	✓		
PS.9	✓		
PS.10	✓		
PS.11	✓		
Additional Criteria			
PS-AC.1	✓		
PS-AC.2	✓		
PS-AC.3	✓		
PS-AC.4	✓		
PS-AC.5	✓		

**The Virginia Department of Education recommends to the Board of Education:**

YES ✓

NO

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	Adequate	Limited	No Evidence
PS.1 The student will plan and conduct investigations in which			
a) chemicals and equipment are used safely;	✓		
b) length, mass, volume, density, temperature, weight, and force are accurately measured and reported using metric units (SI – International System of Units);	✓		
c) conversions are made among metric units applying appropriate prefixes;	✓		
d) triple beam and electronic balances, thermometers, metric rulers, graduated cylinders, and spring scales are used to gather data;	✓		
e) numbers are expressed in scientific notation where appropriate;	✓		
f) research skills are utilized using a variety of resources;	✓		
g) independent and dependent variables, constants, controls, and repeated trials are identified;	✓		
h) data tables showing the independent and dependent variables, derived quantities, and the number of trials are constructed and interpreted;	✓		
i) data tables for descriptive statistics showing specific measures of central tendency, the range of the data set, and the number of repeated trials are constructed and interpreted;	✓		
j) frequency distributions, scattergrams, line plots, and histograms are constructed and interpreted;	✓		
k) valid conclusions are made after analyzing data;	✓		
l) research methods are used to investigate practical problems and questions;	✓		
m) experimental results are presented in appropriate written form; and	✓		
n) an understanding of the nature of science is developed and reinforced.	✓		
<b>Overall Rating for Standard</b>	✓		

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	Adequate	Limited	No Evidence
PS.2 The student will investigate and understand the basic nature of matter. Key concepts include			
a) the particle theory of matter;	✓		
b) elements, compounds, mixtures, acids, bases, and salts;	✓		
c) solids, liquids, and gases;	✓		
d) characteristics of types of matter based on physical and chemical properties;	✓		
e) physical properties (shape, density, solubility, odor, melting point, boiling point, color); and	✓		
f) chemical properties (acidity, basicity, combustibility, reactivity).	✓		
<b>Overall Rating for Standard</b>	✓		

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	<b>Adequate</b>	<b>Limited</b>	<b>No Evidence</b>
PS.3 The student will investigate and understand the modern and historical models of atomic structure. Key concepts include			
a) the contributions of Dalton, Thomson, Rutherford, and Bohr in understanding the atom; and	✓		
b) the modern model of atomic structure.	✓		
<b>Overall Rating for Standard</b>	✓		

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	Adequate	Limited	No Evidence
PS.4 The student will investigate and understand the organization and use of the periodic table of elements to obtain information. Key concepts include			
a) symbols, atomic number, atomic mass, chemical families (groups), and periods;	✓		
b) classification of elements as metals, metalloids, and nonmetals; and	✓		
c) simple compounds (formulas and nature of bonding).	✓		
<b>Overall Rating for Standard</b>	✓		

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	Adequate	Limited	No Evidence
PS.5 The student will investigate and understand changes in matter and the relationship of these changes to the Law of Conservation of Matter and Energy. Key concepts include			
a) physical changes;	✓		
b) nuclear reactions (products of fusion and fission and the effects of these products on human beings and the environment); and	✓		
c) chemical changes (types of reactions, reactants and products, and balanced equations).	✓		
<b>Overall Rating for Standard</b>	✓		

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	Adequate	Limited	No Evidence
PS.6 The student will investigate and understand states and forms of energy and how energy is transferred and transformed. Key concepts include			
a) potential and kinetic energy;	✓		
b) mechanical, chemical, and electrical energy; and	✓		
c) heat, light, and sound.	✓		
<b>Overall Rating for Standard</b>	✓		

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	Adequate	Limited	No Evidence
PS.7 The student will investigate and understand temperature scales, heat, and heat transfer. Key concepts include			
a) Celsius and Kelvin temperature scales and absolute zero;	✓		
b) phase change, freezing point, melting point, boiling point, vaporization, and condensation;	✓		
c) conduction, convection, radiation, and	✓		
d) applications of heat transfer (heat engines, thermostats, refrigeration, and heat pumps).	✓		
<b>Overall Rating for Standard</b>	✓		



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Science Standard	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include			
a) wavelength, frequency, speed, and amplitude;	✓		
b) resonance;	✓		
c) the nature of mechanical waves; and	✓		
d) technological applications of sound.	✓		
<b>Overall Rating for Standard</b>	✓		

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Science Standard	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
PS.9 The student will investigate and understand the nature and technological applications of light. Key concepts include			
a) the wave behavior of light (reflection, refraction, diffraction, and interference);	✓		
b) images formed by lenses and mirrors; and	✓		
c) the electromagnetic spectrum.	✓		
<b>Overall Rating for Standard</b>	✓		

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	Adequate	Limited	No Evidence
PS.10 The student will investigate and understand scientific principles and technological applications of work, force, and motion. Key concepts include			
a) speed, velocity, and acceleration;	✓		
b) Newton's laws of motion;	✓		
c) work, force, mechanical advantage, efficiency, and power; and	✓		
d) applications (simple machines, compound machines, powered vehicles, rockets, and restraining devices).	✓		
<b>Overall Rating for Standard</b>	✓		

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Science Standard	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
PS.11 The student will investigate and understand basic principles of electricity and magnetism. Key concepts include			
a) static electricity, current electricity, and circuits;	✓		
b) magnetic fields and electromagnets; and	✓		
c) motors and generators.	✓		
<b>Overall Rating for Standard</b>	✓		

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Additional Criteria	<b>Rating Scale</b> Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
1. Safe use of materials and equipment is encouraged.	✓		
<b>Overall Rating for Additional Criteria 1</b>	✓		
2. Materials emphasize the use of effective instructional practices and learning theories. <ul style="list-style-type: none"> <li>• Students are guided through different approaches such as the learning cycle.</li> <li>• Students are provided the opportunity to conduct scientific inquiry appropriate for their age, grade, and maturity.</li> <li>• Concepts are introduced through concrete experiences.</li> <li>• Students are required to use manipulative materials during investigations and activities.</li> <li>• Multiple opportunities are provided for students to apply concepts.</li> <li>• Learning activities offer opportunities for students to revise their prior knowledge and create new knowledge.</li> <li>• Students are encouraged to pose questions and to identify problems, as well as propose multiple solutions and design and conduct tests of inference.</li> <li>• Students collect and interpret data through a variety of technologies and draw conclusions based on that data.</li> </ul>	✓		
<b>Overall Rating for Additional Criteria 2</b>	✓		

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Additional Criteria	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
3. Materials present content in an accurate, unbiased manner, and are based on sound science. <ul style="list-style-type: none"> <li>Materials do not contain content errors (omissions of current content, out-of-date content, overgeneralizations, etc.).*</li> <li>Materials do not contain production errors (misspelled words, word omissions, incorrect answers).*</li> <li>Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately.</li> <li>The materials are free of non-scientific explanation.</li> </ul>	✓		
<b>Overall Rating for Additional Criteria 3</b>	✓		

\*Please note that the Department of Education does not certify that all inaccuracies and/or grammatical errors have been detected in this instructional item and reported in this correlation profile.

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	<b>Adequate</b>	<b>Limited</b>	<b>No Evidence</b>
4. Materials promote student assessment as an integral part of the instructional process. <ul style="list-style-type: none"> <li>Assessment suggestions and scoring criteria for student performances on work such as lab practicals or tasks, concept maps, research projects, observation checklists, etc., are provided.</li> <li>Assessment items include multiple-choice, short answer, essay and open-ended questions with charts, graphs, and diagrams imbedded within the items.</li> <li>Options include techniques for assessing students' prior knowledge.</li> <li>Assessment items reflect the rigor and the intent of the standards. For example, they require students to use higher order thinking skills to apply, analyze, synthesize, evaluate, and make judgments or recommendations.</li> </ul>	✓		
<b>Overall Rating for Additional Criteria 4</b>	✓		

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	<b>Adequate</b>	<b>Limited</b>	<b>No Evidence</b>
5. Materials are presented in an organized, logical manner and are appropriate for the age, grade, and maturity of the students. <ul style="list-style-type: none"> <li>• Materials are organized appropriately within and among units of study.</li> <li>• Format design includes titles, subheadings, and appropriate cross-referencing for ease of use.</li> <li>• Writing style, length of sentences, and vocabulary are appropriate.</li> <li>• Graphics and illustrations are appropriate.</li> <li>• Level of abstraction is appropriate, and real life examples, including careers are provided.</li> <li>• Sufficient applications are provided to promote depth of understanding.</li> </ul>	✓		
<b>Overall Rating for Additional Criteria 5</b>	✓		